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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,220	10/26/2005	R .Rogers Yocum	BGI-154US2	2729

959 7590 04/28/2009  
LAHIVE & COCKFIELD, LLP  
FLOOR 30, SUITE 3000  
ONE POST OFFICE SQUARE  
BOSTON, MA 02109

EXAMINER
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FRONDA, CHRISTIAN L

ART UNIT	PAPER NUMBER
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1652

MAIL DATE	DELIVERY MODE
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04/28/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/520,220	<b>Applicant(s)</b> YOCUM ET AL.	
	<b>Examiner</b> CHRISTIAN L. FRONDA	<b>Art Unit</b> 1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15,23,28,31-33 and 50-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15,23,28,31-33 and 50-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. Claims 1-15, 23, 28, 31-33, and 50-65 are under consideration in this Office Action.
2. The rejection of claims 1-15, 23, 28, 31-33, and 50-65 under 35 U.S.C. 112, second paragraph, as being indefinite has been withdrawn in view of applicants' arguments and claim amendment filed 01/29/2009.
3. The rejection of claims 1-15, 23, 28, 31-33, and 50-65 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement has been withdrawn in view of applicants' arguments and claim amendment filed 01/29/2009.

***Claim Rejections - 35 U.S.C. § 112, 1st Paragraph***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:  
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
5. Claims 1-15, 23, 28, 31-33, and 50-65 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a process for the production of pantothenate comprising culturing a *Bacillus subtilis* host cell transformed with the plasmid pAN396 containing the glyA gene consisting of SEQ ID NO: 24 and the plasmid pAN824 containing the serA gene consisting of SEQ ID NO: 31; does not reasonably provide enablement for any other embodiment as recited in the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. Applicants' arguments filed 01/29/2009 have been fully considered but are not persuasive for reasons of record as supplemented below.

According to MPEP 2164.01(a), factors considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is “undue” include, but are not limited to: (A) The breadth of the claims; (B) The nature of the invention; (C) The state of the prior art; (D) The level of one of ordinary skill; (E) The level of predictability in the art; (F) The amount of direction provided by the inventor; (G) The existence of working examples; and (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

MPEP § 2164.04 states that while the analysis and conclusion of a lack of enablement are based on the factors discussed in MPEP § 2164.01(a) and the evidence as a whole, it is not necessary to discuss each factor in the written enablement rejection. The language should focus on those factors, reasons, and evidence that lead the examiner to conclude that the specification fails to teach how to make and use the claimed invention without undue experimentation, or that the scope of any enablement provided to one skilled in the art is not commensurate with the scope of protection sought by the claims. Accordingly, the factors most relevant to the instant rejection are addressed in detail below.

The nature and breadth of the claims encompass any processes for the enhanced production of pantothenate comprising culturing microorganisms having any deregulated enzymes of the MTF biosynthetic pathway and/or any deregulated of enzymes of the pantothenate biosynthetic pathway under conditions such that pantothenate production is enhanced as compared to a wild-type microorganism, wherein deregulation of the MTF biosynthetic pathway is achieved by deregulating the gene product of *gcv*, *sera*, *serC*, *serB*, *glyA*, *sul*, *fol*, *mtrA*, *pag*, *panB* or *purR* derived from a microorganism of the genus *Bacillus*, *Corynebacterium*, *Lactobacillus*, *Lactococci*, or *Streptomyces*.

The reference of Chica et al. (Curr Opin Biotechnol. 2005 Aug;16(4):378-84; reference of record) teaches that the complexity of the structure/function relationship in enzymes has proven to be the factor limiting the general application of rational enzyme modification and design, where rational enzyme modification and design requires in-depth understanding of structure/function relationships. The reference of Sen et al. (Appl Biochem Biotechnol. 2007 Dec;143(3):212-23; reference of record) teaches *in vitro* recombination techniques such as DNA

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shuffling, staggered extension process (StEP), random chimeragenesis on transient templates (RACHITT), iterative truncation for the creation of hybrid enzymes (ITCHY), recombined extension on truncated templates (RETT), and so on have been developed to mimic and accelerate nature's recombination strategy. However, such directed evolution techniques only enable methods for searching and screening for enzymes with a desired property or properties.

As previously stated, the specification provides guidance, prediction, and working examples for a process for production of pantothenate comprising culturing a *Bacillus subtilis* host cell transformed with the plasmid pAN396 containing the *glyA* gene consisting of SEQ ID NO: 24 and the plasmid pAN824 containing the *serA* gene consisting of SEQ ID NO: 31. The specification, however, does not provide guidance, prediction, and working examples for making the scope of the entire invention as claimed, wherein enhanced production of pantothenate relies upon the any deregulation including any genetic modification that increases or decreases the activity of the of the gene product of *gcv*, *serA*, *serC*, *serB*, *glyA*, *sul*, *fol mtrA*, *pag*, *panB* or *purR* derived from a microorganism of the genus *Bacillus*, *Corynebacterium*, *Lactobacillus*, *Lactococci*, or *Streptomyces* in the recited microorganism.

Thus, an undue amount of trial and error experimentation must be preformed where such experimentation involves searching and screening for any deregulation including any genetic modification that increases or decreases the activity of the of the gene product of *gcv*, *serA*, *serC*, *serB*, *glyA*, *sul*, *fol mtrA*, *pag*, *panB* or *purR* derived from a microorganism of the genus *Bacillus*, *Corynebacterium*, *Lactobacillus*, *Lactococci*, or *Streptomyces*; and determining whether such deregulation in the recited microorganism results in an enhanced production of pantothenate compared to a wild-type microorganism. General teaching regarding screening and searching for the claimed invention is not guidance for making the claimed invention.

Therefore, in view of the overly broad scope of the claims, the specification's lack of specific guidance and prediction, the specification's lack of additional working examples, and the amount of experimentation required; it would require undue experimentation for a skilled artisan to make and use the claimed invention. Without sufficient guidance, the experimentation left to those skilled in the art is unnecessarily and improperly extensive and undue. See *In re Wands* (858 F.2d 731, 8 USPQ 2d 1400 (Fed. Cir. 1988)).

*Conclusion*

6. No claim is allowed.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian L Fronda whose telephone number is (571)272-0929. The examiner can normally be reached Monday-Thursday and alternate Fridays between 9:00AM - 5:00PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nashaat Nashed can be reached on (571)272-0934. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christian L. Fronda/

Primary Examiner

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